

What is claim d is:

1. A motor control system for driving a motor with a PWM control using an electric power converter such as a three-phase inverter, etc., comprising:

5 junction temperature calculating means for calculating a junction temperature of a switching element of the electric power converter; and

 junction temperature reducing means for comparing the junction temperature calculated by the junction temperature
10 calculating means with a preset temperature limit and for performing junction temperature reduction processing to make the junction temperature equal to or less than the temperature limit when the junction temperature exceeds the temperature limit.

2. A motor control system for driving a motor with a PWM
15 control using an electric power converter such as a three-phase inverter, etc., comprising:

 loss calculating means for calculating a loss of a switching element of the electric power converter; and

 loss reducing means for comparing the loss calculated by
20 the loss calculating means with a preset loss limit and for performing loss reduction processing to make the loss equal to or less than the loss limit when the loss exceeds the loss limit.

3. A motor control system for driving a motor with a PWM control using an electric power converter such as a three-phase
25 inverter, etc., comprising:

 temperature detecting means for detecting a temperature of a switching element of the electric power converter;

 junction temperature calculating means for calculating a junction temperature of the switching element of the electric
30 power converter when the temperature detected by the temperature detecting means is between a maximum temperature limit of the switching element and a predetermined temperature which is lower than the maximum temperature limit;

 junction temperature reducing means for comparing the

junction temperature calculated by the junction temperature calculating means with a preset temperature limit when the temperature detected by the temperature detecting means is between the maximum temperature limit of the switching element and the predetermined temperature which is lower than the maximum temperature limit and for performing junction temperature reduction processing when the junction temperature exceeds the temperature limit;

loss calculating means for calculating a loss of the switching element of the electric power converter when the temperature detected by the temperature detecting means is equal to or less than the predetermined temperature; and

loss reducing means for comparing the loss calculated by the loss calculating means with a preset loss limit when the temperature detected by the temperature detecting means is equal to or less than the predetermined temperature and for performing loss reduction processing to make the loss equal to or less than the loss limit when the loss exceeds the loss limit.

4. A motor control system for driving a motor with a PWM control using an electric power converter such as a three-phase inverter, etc., comprising:

loss calculating means for calculating a loss of a switching element of the electric power converter;

junction temperature calculating means for calculating a junction temperature of the switching element of the electric power converter;

loss reducing means for comparing the loss calculated by the loss calculating means with a preset loss limit and for performing loss reduction processing to make the loss equal to or less than the loss limit when the loss exceeds the loss limit; and

junction temperature reducing means for comparing, when it is determined by said comparison that the loss is equal to or less than the loss limit or when the loss becomes equal to or less than

the loss limit by the loss reduction processing, the junction temperature calculated by the junction temperature calculating means with a preset temperature limit and for performing junction temperature reduction processing to make the junction temperature
5 equal to or less than the temperature limit when the junction temperature exceeds the temperature limit.

5. The motor control system according to claim 1, 3 or 4, wherein said junction temperature reducing means carries out the junction temperature reduction processing by means of at least
10 one of a method for reducing a number of switchings per unit time and a method for reducing an electric current flowing through the switching element.

6. The motor control system according to claim 2, 3 or 4, wherein said loss reducing means carries out the loss reduction
15 processing by means of at least one of a method for reducing a number of switchings per unit time and a method for reducing an electric current flowing through the switching element.

7. The motor control system according to claim 5, wherein the number of switchings is reduced by lowering a frequency of
20 a base carrier used for generation of a PWM signal.

8. The motor control system according to claim 6, wherein the number of switchings is reduced by lowering a frequency of a base carrier used for generation of a PWM signal.

9. The motor control system according to claim 5, wherein
25 the electric current is reduced by decreasing a duty cycle of a PWM signal.

10. The motor control system according to claim 6, wherein the electric current is reduced by decreasing a duty cycle of a PWM signal.